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Which climate indices are relevant for predicting the response of tropical forests to future climate scenarios ?

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Climate models predict a range of changes in the amazonian region, including increased frequency of extreme climatic events, increased average temperatures, increased atmospheric CO_2 and reduced rainfall intensity.
Understanding tree growth response to climate is important because wood production is the main way carbon enters the forest ecosystem. The response of tropical tree growth to changing climate could drive a change in the direction of the flux from terrestrial ecosystems to the atmosphere.
The last 20 years has seen a substantial increase in the number of publications with a focus on the effects of climate on tropical tree growth. Citation reports extracted from the Web of Science with the keywords ‘climate’, ‘tropical forest’, ‘growth’ and ‘trees’ found only 15 articles in 2000 and more than 70 in 2011. These articles are based mostly on modelling approaches combining tree growth and one or more climate indices.
We review the different approaches used in order to, (i) identify gaps in current research, (ii) determine which climate index is the most relevant for a range of temporal and spatial scales and (iii) establish which climate indices are the most appropriate to study tropical tree growth in regards to the climate output of the IPCC scenarios.